U. S. WAR DEPT FIELD MANUAL 8-25

MEDICAL SERVICE IN JOINT OVERSEA OPERATIONS

~~RESTRICTED~~

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WAR DEPARTMENT

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BY ORDER OF THE SECRETARY OF WAR:

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MEDICAL FIELD MANUAL

MEDICAL SERVICE IN JOINT OVERSEA OPERATIONS

SECTION I

GENERAL

1. SOURCE.—These instructions apply the provisions and implications of official agreements existing between the Army and the Navy relative to the coordination of the Army and the Navy medical services in joint Army and Navy oversea expeditions.

2. PURPOSE.—It is the purpose of this manual to present the problems involved in the care of the sick and wounded in joint oversea expeditions in their several phases, to the end that the tasks of the medical service of the Army and the Navy as to personnel, equipment, supplies, and provisions for hospitalization and evacuation ashore and afloat may be clearly determined in any given operation; to furnish a guide to medical officers of both services who may be charged with the medical preparations for such an expedition; to insure determination of the expedition's medical requirements in the early stages of the planning of any joint oversea expedition; to provide for a timely and sound joint Army and Navy medical plan; and to provide for the full cooperation and coordination of these two medical services in carrying out the expedition commander's mission. Only in launching land attacks from ships and until the Army and its establishments are favorably placed ashore, does a peculiar situation exist which calls for special handling of its medical service, for deprivation of use of usual field equipment, and for dependence upon and close coordination with the naval medical service. Likewise for the Navy, the administration and operation of the Navy medical service afloat, including medical and sanitary requirements for troop ships, are provided for in existing Navy

medical regulations. Only in the necessity of relieving the Army medical service of its task at the shore line and in transporting to and hospitalizing aboard ship and subsequently evacuating to a base port the Army casualties, does a new problem present itself to the Navy—a problem, moreover, which requires the closest coordination with the Army medical service ashore, and which may in some expeditions require naval medical preparations in trained personnel, hospital ships and equipment on a scale of magnitude out of all proportion to that envisaged for normal naval operations against an enemy at sea.

■ 3. ARMY AND NAVY RESPONSIBILITY FOR THE MEDICAL SERVICES.—Army and Navy medical responsibility is, on broad lines, clearly defined as follows:

a. Medical responsibility for its own forces rests with the Army—

(1) During the embarkation phase.

(2) Landward of the high watermark in the operations area.

(3) For debarkation and after debarkation at home ports or bases.

b. The Navy is responsible for the medical service to all Army personnel, as well as Navy and Marine Corps, between ports of embarkation and high watermark on oversea landing beaches, including evacuation and hospitalization afloat and the furnishing of hospital ships, boats, and other equipment and supplies necessary for the execution of this task.

■ 4. RESPONSIBILITY OF COMMAND.—No statement of the duties and responsibilities of a particular medical officer or of the commanding officer of a particular medical unit or establishment, as used in this manual, should be construed as an encroachment upon the authority and responsibility of an Army or Navy force or lower unit commander.

■ 5. THE ARMY FORCE SURGEON AND THE NAVY FORCE SURGEON.—*a. General.*—These officers will be designated by the War Department and the Navy Department, respectively. The Army force surgeon is a member of the technical staff of the Army force commander, the Navy force surgeon is a mem-

ber of the technical staff of the Navy force commander. As soon as practicable after their appointments, they should recommend to their respective commanders the assignment to them for duty of the necessary personal assistants from their own corps. These two groups of assistants should be selected and organized not only with a view to the task of developing and organizing the oversea expedition's medical service but more particularly for the greatly increased coordinated activities of the two medical services to be expected later on in the operations area. An executive and an evacuation officer should be chosen for each staff.

b. Official relationship.—The official relationship of these chiefs of the two medical services to each other in the execution of their duties is basically that of their respective commanding officers to each other. This relationship is specifically conditioned by the complementary character of the two medical services in a joint oversea expedition, whereby during the embarkation phase, the Army and the Navy force surgeons are responsible for their respective medical services directly to their own force commanders; normally the Navy force surgeon, during the oversea movement and in the landing area, is responsible for evacuation and hospitalization afloat for the entire expeditionary force between the port (or ports) of embarkation and the high watermark on the landing beach or beaches, from which point landward the Army force surgeon is responsible for the medical service to all landed elements of the expeditionary forces under Army command. This complementary character of the two medical services in a joint oversea expedition calls for the fullest coordination and cooperation between the senior Army and the senior Navy surgeon, which must extend to the lowest echelons of the two medical services. It is an important duty and responsibility of these officers to see that this close cooperation and coordination prevails throughout at all times.

SECTION II

CASUALTIES IN JOINT OVERSEA EXPEDITIONS IN RELATION TO THE JOINT PLAN AND TO THE MEDICAL PLAN

■ 6. IMPORTANCE OF THE PROBLEM OF CASUALTIES IN PLANNING.—*a.* Recognizing, anticipating, and adequately providing for casualties in the basic planning is the key to a sound medical plan.

b. Experience has shown that in a large scale Army and Navy oversea expedition against stubborn enemy resistance, the casualties from all causes may prove to be a far greater handicap than had been expected. The large number of casualties and the necessity for taking care of them and of making the best practicable disposition of them in the face of inadequate facilities and other difficulties may bog down or even defeat the undertaking. Such a situation comes about largely because this aspect of the logistics of the expeditionary operations had not been clearly visualized beforehand and realistically provided for, primarily in the joint plan and secondarily in the joint medical plan. The probability of its occurrence can be avoided only by a careful study of all factors likely to affect the casualty rate and of other logistic facts bearing directly on this problem, and then to provide and properly organize early in the joint planning a sufficient and adequately equipped Army and Navy medical service. Experience likewise has shown that the most difficult, the most sensitive, and the most liable to insufficiency of facilities is the link from the shore line to the home port or other base.

c. (1) For purposes of computation, the daily sick admission rate to hospital may, with few exceptions, be assumed to be the same in different joint oversea plans.

(2) Battle casualty rates, during the landing phases of the operations in which the Navy must of necessity assume responsibility for all except the slightly sick and wounded (and usually many of these), may vary from practically nil to 25 percent of the Army (and Marine Corps) forces landed. This indicates that in planning, all factors and conditions which may affect the battle casualty rates in the landing oper-

ations contemplated must be weighed carefully and that a reasonable factor of safety should be added to the computed requirements of sea-trained medical personnel, regular and auxiliary hospital ships and of medical equipment and supplies.

(3) The medical provisions in Navy ships are usually adequate for the proper care of the normal roll of sick and injured among their own complements, if evacuation from the fleet to a home port or other base is carried out as indicated in paragraph 9*c*.

(4) Naval battle losses resulting from enemy action in the oversea operations area are extremely difficult to foresee with any degree of accuracy in most proposed joint operations. Ordinary prudence, therefore, requires that a substantial factor of safety be provided for this class of casualties in the approved medical plan in the form of additional hospitalization facilities afloat and the requisite sea-trained medical personnel.

(5) Naval and military losses and hospitalization requirements should be computed separately and coordinated for the planning staff by the Navy force surgeon and the Army force surgeon.

(6) In estimating the medical-service requirements for a contemplated joint Army and Navy oversea expedition against enemy objectives, it is necessary to foresee a certain accumulation of Army and Navy casualties afloat. This accumulation is conditioned by two basic factors: the distance from the operations area to the home port or other base, and the elapsed time from the initial landing attack to the day when the Army has firmly established itself ashore with sufficient elbow room for its more hospital-like installations such as evacuation hospitals. Each of these factors is variable. The effects of the former, however, can be computed in advance with fair accuracy, the latter with far less. In the basic planning, it is therefore necessary to take these factors into consideration and to make a reasonable allowance for this indeterminate initial accumulation of patients afloat. If all hospital ships approved by the expeditionary force commander for the service of the expedition up to the establishment of the Army ashore do not actually accompany the

fleet from the port of embarkation, the greater part of them should do so and the remainder should be scheduled to arrive in the operations area at specified dates shortly thereafter.

■ 7. CLASSIFICATION OF CASUALTIES.—In order to make the best use of available hospital facilities afloat and ashore and to expedite evacuation and treatment, casualties are classified according to—

a. Method of transporting:

(1) Walking cases.
(2) Sitting cases.
(3) Litter (stretcher) cases.
(4) Nontransportable.

b. Treatment required:

(1) Nontransportable wounded.
(2) Seriously wounded (litter cases).
(3) Slightly wounded (walking or sitting cases).

c. Time of recovery:

	Percent
(1) Cases returning to duty within 30 days	33
(2) Cases returning to duty within 90 days	37
(3) Cases permanently lost as a military asset	30

■ 8. CASUALTY RATES.—*a. Sick and nonbattle injuries.*—(1) *Army.*—If trained and somewhat seasoned troops are employed, a daily sick admission rate to hospital of 1.65 per thousand should be used. This was the rate in the American Expeditionary Forces for sick and nonbattle injuries during the period of hard fighting from July 1 to November 11, 1918.

(2) *Navy.*—See paragraph 6*c* (3).

b. Battle casualties.—(1) *Navy.*—As a guide to the fleet surgeon in his estimate of the hospitalization afloat to be provided for casualties inflicted by the enemy, see paragraph 6*c* (4).

(2) *Army (and Marine Corps).*—(*a*) Experience has proved that battle casualty rates in a landing operation against enemy resistance may vary from practically nil to 25 percent of the Army strength landed. Losses in individual battalions may amount to 50 percent. Reasonably accurate estimates in advance for the whole Army force are difficult. Nevertheless, an estimate must be made early in the joint

planning. The estimate should be based on the best available intelligence data, including—

1. Strength, composition, and armament of the joint oversea expedition.
2. Contemplated methods of carrying out the landing operations.
3. Enemy's naval strength and naval efficiency.
4. Enemy's military strength and locally available military resources; his national military characteristics in defense; his probable or possible adequacy and extent of defense armaments, dispositions, and positions.
5. Modern historical experiences in analogous operations.

(*b*) Necessary data concerning *1* to *4* above must be obtained from the proper Army and Navy planning officers and evaluated by the Navy force surgeon and the Army force surgeon at the earliest practicable date in the joint planning.

■ 9. SUMMARY OF ESTIMATES FOR INITIAL HOSPITALIZATION REQUIREMENTS AFLOAT.—These estimates, for the Army and the Navy staffs primarily and for the joint medical plan thereafter, should include initial expeditionary hospitalization afloat for—

a. The Army sick from day of embarkation until the time the Army is prepared to care for its own sick on enemy territory.

b. Evacuation by hospital ship of at least 10 percent of these sick to the home port or other base.

NOTE.—Ten percent is probably the minimum; 7.52 percent of the sick in the AEF were evacuated to the United States. In the first few weeks following a successful combined attack from the sea, the Army will not be prepared to hospitalize and hold for definitive treatment as large a percentage of its seriously sick as was the case in France in 1917 and 1918.

c. Evacuation from the operations area of at least 10 percent of the Navy's sick during the same period, by hospital ship.

d. Army battle casualties must be hospitalized and evacuated by the Navy until the establishment of Army hospitalization ashore. At least part of the slightly wounded must be

hospitalized by the Navy in the operations area but not evacuated from it. Many of these can be adequately cared for on transports in the operations area. Depending on circumstances, it may be as much as 4 months or even longer before the Army can open general hospitals or their equivalents ashore. (See App.)

SECTION III

PLANNING AND EMBARKATION

10. GENERAL.—*a.* The subject matter of this section and section IV envisages the employment of considerable forces of both the Army and the Navy, involving landing against opposition. Lesser efforts as a rule are simpler of execution and require less extensive preparations.

b. In the care and handling of the expedition's sick and wounded (hospitalization and evacuation) the Navy has the heavier and more difficult task until the Army has established its own hospitalization ashore, as past experiences have demonstrated that evacuation of casualties and their temporary hospitalization afloat may become one of the most extensive and difficult of the logistic activities of a joint oversea operation. Naval medical preparations must therefore be proportionate to the magnitude of the task. Two requirements in the joint planning, which are distinct from and additional to the Army medical service of the expedition, must be foreseen and met:

(1) An adequate, highly trained directing naval medical staff.

(2) A well-organized and trained naval medical service adequate in personnel, hospital ships, boats, equipment, and supplies.

NOTE.—In the 26 days from August 10 to September 5, 1915, the British evacuated from the shore line of the Gallipoli peninsula 50,000 sick and wounded (20,000 and 30,000 respectively), an average of about 2,000 daily.

c. Oversea evacuation from a large landed force in contact with the enemy and without hospitilization established on shore is a delicate and precarious business, very easily thrown into confusion by sea, weather, and enemy interference. A

margin of safety is therefore necessary. Its organization must be simple and flexible but complete. Its execution must be in the hands of one man, the Navy force surgeon, assisted by an adequate sea-trained personal staff and in harmonious relationship with the Army force surgeon and his staff.

■ 11. WHEN MEDICAL PLANNING IS TO BE INITIATED.—*a.* Medical planning and preparations will be initiated early in the joint planning. This preparation includes the procurement, conversion, manning, and special equipping of the required commercial shipping for hospitalization afloat, to be ready by the date the expedition leaves the port of embarkation. Other medical preparations, though generally requiring less time, must receive early consideration in the basic planning. Hospital ship beds necessary or desirable for purely naval combat afford no guide to the requirements of a strong joint Army and Navy oversea expedition in which floating hospitalization and sea-trained medical personnel must be provided on a much greater scale.

b. Medical elements of the Army and Navy, as integral operating parts of the expeditionary forces, should be fitted into their proper positions and assume their correct proportions from the beginning. The functions of the medical members of the Army and Navy planning staffs are two-fold. They act primarily as technical advisers to their respective commanders and staffs in all matters pertaining to medical problems, making, when necessary, appropriate recommendations in the premises; at the same time they supervise and coordinate the medical preparations of their respective services. It will be conducive to harmonious teamwork and to more satisfactory results later when the joint plan is put to the test of battle, if the Army force and the Navy force chief surgeons (and the expeditionary force chief surgeon if coordination is to be exercised by unity of command) are appointed early and assume their proper functions on the respective planning staffs. This manual is predicated on this practice obtaining.

■ 12. INHERENT LIMITATIONS.—Medical officers called upon to participate in the medical planning of a joint oversea expedition should understand that their recommendations and estimates of medical requirements, while adequate, should be

measured and judicious. Because of the nature of the undertaking, space, personnel, and matériel limitations confront all arms and services in the organization of such an expedition.

■ 13. SEQUENCE OF PREPARATION AND EXECUTION OF PLANS.—*a.* Medical planning divides itself into three phases: planning to include embarkation, planning for the movement overseas, and planning for the operations in the landing area. Since all planning and preparation are for the purpose of executing certain predetermined missions in the landing area, it should be emphasized that the plan for embarkation and movement overseas should be based upon the requirements of the plan covering the actual landing operations.

b. The evacuation plan must therefore be the first prepared. It is formulated by the Army and Navy medical staff according to the provisions of the tactical plan as furnished by the proper staff sections, and the estimate of casualties prepared after the evaluation of the information listed in paragraph 8, and it states definitely the methods by which the estimated casualties are to be cared for in the landing area(s) and the means that must be provided to accomplish the task. These estimated means which must later be converted into form, include personnel, units, and matériel. Having determined the requirements of the Army and Navy medical services for an adequate evacuation system, the embarkation, oversea movement, and landing phases can be planned and provided for in the necessary detail. For convenience, the important matters to be covered in the joint medical plan, as enumerated in paragraph 15 *a* and *b*, appear there under the heading of the phases in which they are to be carried out. All or most of them should be planned and prepared for in the embarkation phase. Thus the evacuation plan which is the basis of the whole medical plan comes last in this outline, since in point of time it is the last major provision of the plan to be executed.

c. In the logical development of planning, however, the medical plan itself usually will be preceded by the formulation of a joint medical estimate corresponding to the stage of planning reached in the joint estimate for the expeditionary forces. As a preliminary statement of medical requirements based on staff data which have not yet been developed into

the final provisions and form of the joint plan or the orders of the Army force and Navy force commands, this estimate will be less complete and final in provisions and form than the joint medical plan which will be prepared later from more accurate data and final command decisions.

■ 14. THE JOINT MEDICAL ESTIMATE.—*a.* Based on the tactical plan, the estimate of casualties and their location, the evacuation plan, and the estimate of means required by the medical services supplemented by consultations with the proper officers of the Army and Navy, a joint medical estimate is prepared by the expeditionary chief surgeon in the case of coordination by unity of command or the Army force surgeon and the Navy force surgeon if coordination is to be exercised by mutual cooperation. The estimate covers the following basic matters:

(1) *For the Army.*—(*a*) Requisite Medical Department personnel and units and their procurement.

(*b*) Additional or special training required for Medical Department personnel.

(*c*) Examinations and other medical preparation of all troops for embarking.

(*d*) Special measures for maintenance of the health and physical condition of the Army forces up to arrival in operations area, especially if the measures recommended require early action by the Army and the Navy staffs.

(*e*) Standard medical and special equipment.

(2) *For the Navy.*—(*a*) Requisite Medical Department personnel and units and their procurement.

(*b*) Additional or special training required for Medical Department personnel.

(*c*) Naval hospital ships, class A and class B.

(*d*) Hospital ships, class D, and their medical equipping, staffing, and manning.

(*e*) Ambulance boats and other boats required by the Navy force surgeon for the efficient control and operation of his service in the landing area.

(*f*) Sanitary requirements and installations in troop ships; and any other special arrangements for the maintenance of the physical condition of troops which will require early action.

(*g*) Standard medical and special equipment.

b. Before submitting this estimate for approval, it should be carefully reviewed to see that it corresponds in its requirements with the current developments of the expeditionary planning.

c. It is the duty of the Army and the Navy force surgeons to prepare and submit estimates for all medical means which in their judgment, based on full knowledge of the contemplated operations and in the light of past experience, are necessary for the efficient operation of the Army and the Navy medical services and for the proper care of the sick and wounded of the expeditionary forces. It is solely the responsibility of the expedition commander, or in the case of coordination by mutual cooperation, of the Army and the Navy force commanders, to decide the extent to which these means shall be provided. (See par. 4.)

■ 15. THE JOINT MEDICAL PLAN.—The joint medical estimate (par. 14) having been approved with or without modifications by the expedition commander in the case of coordination by unity of command, or by the Army force and Navy force commanders if coordination is by mutual cooperation, the same medical officer or officers as given in paragraph 14 proceed at the proper time to formulate the joint medical plan for the contemplated oversea expedition. Again the intelligent preparation of this plan requires intimate knowledge of the joint plan and continued close collaboration with the Army and Navy planning staffs. Between the submission of the medical estimate and the preparation of the medical plan, additional and more precise information becomes available as the joint plan itself or the plans of the Army and the Navy force commanders take definite form. The joint medical plan provides as specifically as can be foreseen as follows:

a. For the Army.—(1) *Embarkation phase.*—(*a*) Special training for all Medical Department units to be carried out before embarking.

(*b*) Medical units and equipment to be—

1. Combat unit loaded.

2. Organizational unit loaded.

3. Convoy unit loaded.

(*c*) Priorities of embarkation and debarkation of medical units and supplies with notation of assignments to ships.

(*d*) Plan of medical supply.

(*e*) Special measures to insure the health and physical condition of the Army forces up to their arrival in the landing area.

(*f*) Timely inspection of the troop transports and recommendations to insure the provision of adequate facilities for the troops while aboard ship.

(*g*) Embarkation inspection of all Army troops.

(*h*) Provision for the necessary liaison with the Navy medical service.

(*i*) Alternative medical plans based on the alternative plans of the Army force commander.

(2) *Movement oversea phase.*—(*a*) Medical care and hospitalization, records, and reports of Army troops in transports and other ships.

(*b*) Responsibility for sanitary inspections in troop ships, as between Army and Navy medical services.

(*c*) Completion of the joint medical plan and of those of the lower echelons; modifications of the joint medical plan and of those of lower echelons to meet changes made in the joint plan and in those of the Army force and Navy force commanders.

(*d*) The following medical details which may be finally coordinated during the oversea movement:

1. Number and classes of patients each ship may receive.
2. Medical supply of each ship.
3. Emergency medical reinforcements for each ship and how they are to be made.
4. Order in which hospital ships are to return to base to discharge patients.
5. Action to be taken should losses exceed expectations and the capacity of the ships allotted wholly or in part to the medical services be exceeded.

(*e*) Alternative plans.

(3) *Landing phase.*—(*a*) Debarkation of medical units and equipment in accordance with the Army force commander's plans.

(*b*) Evacuation from each of the designated landing places.

(*c*) Progressive establishment of medical units, installations, and hospitals ashore, and the organization of the medical service on land, in accordance with the Army commander's plan.

(*d*) Designated medical personnel and equipment for the medical service of any separate or special missions assigned in the joint plan to Army forces.

(*e*) Supervision of water supplied to troops on shore and inland.

(*f*) Alternative plans.

(4) *Evacuation plan.*—Evacuation by Army on land to shore line.

(*a*) Maintenance of direct contact by Army force surgeon with Navy force surgeon until landing has progressed to point where Army force surgeon can go ashore and supervise Army medical service from land; thereafter contact with Navy force surgeon by liaison officer.

(*b*) Evacuation officer (on shore party commander's staff) to be provided with the necessary Army medical commissioned and enlisted personnel and equipment and supplies for—

1. Sorting and handling patients on shore.
2. Reports and records.
3. Contact with other Army medical units and establishments at or near shore.

(*c*) Replenishment of supplies to medical elements ashore.

(*d*) Assistance to Navy medical service in early stages of landing by utilization of low debarking priority medical units on board transports or other vessels.

(*e*) Progressive utilization ashore of medical personnel, units, and establishments for medical support of landed forces, beginning with battalion medical detachments with first wave battalions and progressing as the situation permits to general hospitalization and other permanent medical establishments.

(*f*) Extension of medical service to all beaches occupied by our forces and to landings made by detached Army forces.

(*g*) Provision of liaison and effective coordination between the Army and the Navy medical services throughout.

(*h*) Alternative plans.

b. For the Navy.—(1) *Embarkation phase.*—(*a*) Organization, assignments, and special training of medical personnel.

(*b*) Necessary hospital ships, both Navy and those converted from commercial shipping, in accordance with the approved joint medical estimate (sec. II), their equipment and medical complements.

(*c*) Measures for preparing designated troop ships of the expeditionary forces for hospitalizing light casualties in the operations area.

(*d*) Provision of ambulance boats for use in the landing area.

(*e*) Provisions for the medical personnel with Marine Corps units designated to participate in the landings.

(*f*) Ship assignments and embarkation priorities of medical units and equipment, including also the same information and debarkation schedule of Army medical troops attached to combat troops of the first and second landing phases.

(*g*) Plan of medical supply.

(*h*) Provision of necessary sanitary installations and other facilities for the maintenance of health and physical condition of all forces in the movement overseas with special attention to troop transports.

(*i*) Provisions for the necessary liaison with the Army medical service.

(*j*) Embarkation medical inspection of Navy and Marine Corps forces.

(*k*) Alternative plans based on the alternative plans of Navy force commander.

(2) *Movement oversea phase.*—(*a*) Plan for the coordinated medical service to all forces with detailed arrangements with Army for medical service for Army troops aboard ships.

(*b*) Plan for the necessary medical and sanitary inspections in all ships.

(*c*) Instructions for medical records and reports of Army troops which are to be furnished to the Navy.

(*d*) Arrangements for completing details of the joint medical plan and those of the lower echelons; modifications of joint medical plan and those of lower echelons to meet

changes made in the joint plan or in those of the Army force and Navy force commanders.

(*e*) See *a* (2) (*d*) above.

(*f*) Alternative plans.

(3) *Landing phase.*—(*a*) Definite and detailed means other than ambulance boats to be provided for shore to ship transportation of casualties and when they will be available.

(*b*) The coordination of naval medical service with Army commander's debarkation schedule and tables.

(*c*) The equipment, movement, supply, and operation of the medical section of the beach party on each landing beach.

(*d*) The utilization of Army medical units of low debarking priority in transports for the care of wounded arriving from beaches in the early stages of landing.

(*e*) The designated personnel and equipment for the medical service of separate or special missions assigned in the joint plan to the naval force.

(*f*) Provision of communication for medical messages between ship and ship and ship to shore as to beds aboard ship.

(*g*) Plan for inspection of transfer of casualties from ship to hospital ship and vice versa and for inspection of care of casualties being treated aboard transports during landing and number of beds.

(*h*) Evacuation and medical supply after docking facilities are available.

(*i*) Alternative plans.

(4) *Evacuation plan.*—Navy responsibility from shore line to shore line. A naval evacuation service under the supervising and coordinating control of the Navy force surgeon.

(*a*) *Afloat.*

1. Office of the Navy force surgeon:

Executive and evacuation officers and other commissioned assistants; records and statistics personnel; Army medical liaison officer.

2. Hospital ships and the transports specially equipped and staffed for slight casualties, in accordance with joint medical plan's estimate of casualties (sec. II and app.), ambulance boats with crews and medical personnel; motor launch for the Navy force surgeon's communication by water.

3. Plan for ship distribution of patients in operations area.

4. Plan for evacuation to home port or other base.

(*b*) *On each beach.*—Medical embarkation officer (on beach party commander's staff) with sufficient commissioned and enlisted personnel for—

1. Reports and records.
2. Systematic loading of boats with patients.
3. Medical liaison officer with senior Army surgeon ashore, if a considerable force is to be landed.
4. Protection and shelter as the situation permits.

(*c*) The point medical plan, when approved, will constitute the directive to the Army and the Navy chief surgeons for the coordinated operation of their respective medical services from the date of embarkation.

■ 16. EMBARKATION LOADING.—*a. Attached medical troops.*—The organizational equipment of attached medical troops will be loaded with that of the unit to which these belong. If the unit is designated for early participation in the landing attack, the medical equipment will be combat unit loaded in order that it may accompany the detachment upon debarkation. Medical supplies required early by shore party should also be combat unit loaded.

b. Medical regiment, divisional (or medical battalion, triangular division).—(1) The organization equipment of the medical regiment should be stowed so that it is available for use in the following order:

(*a*) Collecting companies; battalion headquarters.
(*b*) Ambulance companies; battalion headquarters.
(*c*) Regimental headquarters.
(*d*) Hospital companies; battalion headquarters.
(*e*) Headquarters and service company.

(2) In stowing this equipment, it is to be remembered that collecting and ambulance companies (less transport) and possibly hospital companies (less transport) may be debarked during the first day's attack. Equipment and supplies that can be transported by hand should be immediately available (combat unit loaded). Other supplies and equipment will be organizational unit loaded.

c. In the next priority of availability should come corps or army medical regiments, surgical hospitals, evacuation hospitals, medical depot (army), and an army medical laboratory. The personnel for these, as for all other medical units, should be embarked in the same vessels as their organizational equipment. Later, in low priority, general and station hospitals with their personnel will be necessary if a base is to be established in the occupied territory.

d. The Navy force surgeon and lower echelons of the naval medical service concerned should be informed of the ship designation and type of loading of the Army medical personnel and matériel scheduled to participate in the landing attack. This information is necessary for the efficient direction and coordination of the naval evacuation service during these operations.

e. The loading schedules and the actual loading should be carefully checked as mistakes made in loading can seldom be corrected after leaving port. Such mistakes may later prove to be extremely hampering to the operation of the medical services, since errors of loading in the wrong ship can delay the use of badly needed equipment and supplies many days or even weeks.

■ 17. MEDICAL SERVICE IN THE OVERSEA MOVEMENT.—The Navy is responsible for this service. The joint medical plan must include the arrangements made for the necessary sanitary inspections and for medical care and hospitalization of the Army troops while en route to the oversea rendezvous. A generally satisfactory method is for the Navy to delegate to the senior Army medical officer of each troop ship the responsibility for the care of the sick and injured troop passengers in his ship and to prepare the medical records and reports required by the War Department, furnishing such copies or other reports to the senior naval medical officer of the ship as may be required by the Navy. The plan will further designate the procedure whereby Army medical officers may obtain the necessary Navy medical supplies, as well as the arrangements for admitting troop passengers to the sick bay.

■ 18. EMBARKATION OF THE ARMY FORCE SURGEON AND THE NAVY FORCE SURGEON.—In accordance with the necessities of the

situation and the basic policy for joint oversea expeditions, the Army and the Navy force surgeons and their immediate assistants should be embarked in the same vessel as are the Army and the Navy force commanders. After reaching the landing area the Army force surgeon should remain in this ship until he can more advantageously perform his duties ashore. If coordination is exercised by unity of command, the expeditionary force chief surgeon should be embarked in the same ship as the expeditionary force commander.

■ 19. EMBARKATION MEDICAL INSPECTION.—Embarkation must be preceded immediately by thorough physical inspections to eliminate all sick, especially those with infectious disease, and others who are not physically fit.

■ 20. AT SEA.—During the voyage, the Army and the Navy senior surgeons work out in necessary detail the evacuation plan; make further arrangements for the more complete coordination of their services in the landing area; modify the joint medical plan to meet any changes made in the basic joint plan or in the plans and orders of the Army and the Navy force commanders; and assure themselves that the lower medical echelons understand and are prepared for their assigned tasks and missions. For additional matters which may be finally arranged during the oversea movement, see paragraph 15*a* (2) (*d*).

SECTION IV

IN LANDING AREA

■ 21. GENERAL.—*a. Evacuation from shore in landing area.*—The plan for this evacuation service will depend upon the number and relative locations of the landing beaches if there is more than one, which will usually be the case, as well as upon the number and locations of the troop and hospital ships in the landing area in relation to the shore. Widely separated or detached landing beaches require separate allotment to them of the necessary hospital ships, ambulance boats, personnel, and matériel for evacuation from shore to ship. Hospital ships at anchorage in the landing area are comparable to evacuation hospitals receiving pa-

tients from front-line divisions in normal land operations. Beach heads are comparable to division hospital stations; and the boats plying between shore and hospital ships correspond to the Army ambulance companies in the Army scheme of evacuation.

b. Evacuation facilities afloat.—For evacuation from shore to ship the following means are employed:

(1) *Small boats returning to ships from landing troops.*—The use of these boats in the initial stages of a landing operation for transporting wounded from shore to ship is uncertain and dependent on the military situation. They cannot be thus employed until the essential combatant troops and their equipment have been put ashore. Until the landing is secured, all other activities must yield to this paramount necessity. Thereafter, perhaps later in the first day's attack, these boats on their return trips to ships may carry casualties, preferably slightly wounded. While being thus used, these boats are not entitled to fly the Red Cross flag nor to the protective provisions of the Geneva Convention.

(2) *Ambulance boats.*—These are motorboats of varying size and design assigned to the operative control of the Navy force surgeon. They fly the Red Cross flag and may be used only for the transportation of casualties, medical personnel, and medical matériel. When thus marked and employed, they are entitled to the protective provisions of the Geneva Convention. The joint medical plan should provide a reasonable number of these boats of approved patient capacity, design, and speed. They should be used primarily for the transportation of seriously wounded cases to hospital ships.

(3) *Lighters and barges.*—Each of these, capable of carrying a large number of wounded on litters or stretchers, should be added to the ambulance boat service in the landing area, to the extent of the requirements, as rapidly as they can be made available after combatant troops and their equipment have been put ashore.

(4) *Motor launch for Navy force surgeon.*—A swift motor launch at the exclusive disposition of the Navy force surgeon and his staff assistants is highly desirable for the efficient administration of the naval evacuation service in the landing

area. The assignment should be made before arrival in the operations area.

NOTE.—Ship's boats generally are not well adapted for use as ambulance boats, especially those below the 40-foot motor launch (class B boat). The 50-foot motor launch (class A boat), except for its too low speed, is fairly satisfactory for this purpose. Loaded Army litters can be stowed in the class A and B boats about as shown below:

ARMY LITTER

	On bottom	Second tier (across thwarts)	Total
50-foot launch	12	12	24
40-foot launch	6	8	14

c. Development of shore-to-ship evacuation.—As a rule, during the initial stages of a landing attack, comparatively few casualties can be removed from beaches. Although the landing of combat troops and matériel must have first consideration, it is highly desirable to have ambulance boats provided for the evacuation of the seriously wounded direct to hospital ships. In any event it is the responsibility of the Navy force surgeon to organize and develop his evacuation service step by step as rapidly as the situation permits; and the detailed plan should provide for the rapid organization of systematic evacuation from shore to ship.

■ 22. DEBARKATION.—The debarkation of Army medical units and equipment is carried out in accordance with Army debarkation tables.

■ 23. PHASES OF LANDING OPERATIONS.—*a.* The dispositions and employment of the Army and the Navy medical services conform to the three general phases of the landing operations in which, during the *first phase,* landings of combat teams on the assigned beaches are made and as rapidly as possible the attack on each beach is pushed forward with such reinforcements as are necessary or available until the beaches are secured from enemy light artillery fire. This requires as the objective for this phase the establishment of a line about 10,000 yards inland. The *second phase* consists of those fur-

ther operations inland which secure the beaches from enemy medium artillery fire. This requires as the objective for this phase the establishment of a line at least 15,000 yards inland. The *third phase* includes the further land and air operations necessary to secure the objectives for which the landing was undertaken.

b. Simultaneous landings are made by as many combat teams on as broad a front as the boat facilities will permit without undue dispersion.

■ 24. ARMY MEDICAL SERVICE DURING FIRST PHASE.—*a. Medical detachments.*—The medical detachments of combat units debark with the organization to which attached. In a combat battalion, two first-aid men wearing Red Cross brassards and carrying as much dressing material as they can, board the landing boats with each company. It is their duty to land with and follow their companies closely, and to render such assistance to the wounded as may be possible. The remainder of the battalion medical detachment will normally go ashore in the later subwave which lands the battalion headquarters, the battalion surgeon accompanying the battalion commander. Ordinarily, only such medical equipment and supplies as may be hand carried can be landed at this time. The men should, however, carry as many dressings, blankets, litters, and as much splinting material as practicable. The detachment's transport and heaviest equipment follow later. The battalion medical detachment of an infantry assault battalion establishes an aid station at or near the beach at the best available site, where the battalion's casualties are collected and treated as in land attacks. As the battalion advances inland, the medical section follows it and establishes successive aid stations according to the situation. The procedure followed by the medical section of an infantry reserve battalion is basically the same as that for the medical troops attached to an assault battalion in the landing, as is also that of the medical sections of field artillery and combat engineer battalions.

b. Regimental sections.—Regimental sections of regimental medical detachments will normally land with their own regimental headquarters and thereafter perform their duties in accordance with the normal practice in offensive operations. In some situations it may be necessary for the regimental

section to take over temporarily a battalion aid station at the beach filled with wounded whom the battalion section has had to leave behind in order to follow its battalion.

c. Beach medical service.—(1) The Army beach medical service proper lands early as a section in the Army shore party and operates thereafter under the shore party commander. The duties of the evacuation officer in charge of this section are to—

(*a*) Organize and coordinate the Army medical service on the beach.

(*b*) Receive, sort, and classify, temporarily care for, and retain control of all casualties arriving at the beach; turn them over to the naval medical embarkation officer (par. 25) only as fast as the latter can dispose of them.

(*c*) Provide such shelter and protection for the casualties as are practicable.

(*d*) Establish and operate a medical supply point.

(*e*) Establish connections with other Army medical units on or near the beach.

(*f*) Assist in forwarding messages and supplies to medical units inland.

(*g*) Mark his station by the Red Cross and other identifying signs.

(*h*) Cooperate closely with the naval medical embarkation officer on his beach.

(2) Wounded may temporarily accumulate in large numbers on the beach. They must be segregated and the walking wounded rigidly controlled; especially must the latter be prevented from interfering with the activities of the beach party. Therefore, casualties ready for evacuation from the beach will be assembled at a location designated by the shore party commander, which should be located with due regard to suitable boat landings, cover from enemy fire, location of the aid or collecting stations, and natural drift of the wounded. One or more such locations may be designated for each beach.

(3) Medical personnel to assist the evacuation officer should come from a corps medical regiment or other medical unit of low debarking priority. This personnel must be adequate for the many duties of the evacuation section of

the shore party, which include the movement of all litter cases collected at the beach to a point on the shore from which they will be loaded into boats by the naval medical embarkation officer's personnel. In emergency, the evacuation officer may have to furnish litter bearers temporarily to assist in loading boats. The initial evacuation section of the shore party landing in the leading combat team may of necessity be only a skeletonized group. In such case its early reinforcement will be provided for.

(4) It is highly important that the sorting, classification, and grouping of patients by the Army evacuation officer is done carefully and systematically. This assists the naval medical embarkation officer materially, permits greater economy in the use of boats and decreases later the secondary transfers from ship to ship.

d. Medical regiment divisional (or medical battalion, triangular division).—(1) *Collecting companies.*—If conditions permit, the personnel of collecting companies land later during the first day's attack, taking with them such matériel as can be hand carried. Litter bearers of collecting companies move out to make contact with regimental and battalion aid stations and evacuate casualties from them to the beach. Other collecting company personnel establish an initial collecting station near the beach. As the beach head is enlarged, collecting companies advance their collecting station inland, maintaining contact with the medical detachments in their zone of action. The transport and heavy equipment of collecting companies can be landed only after boats and simple docking facilities have become available for this use.

(2) *Ambulance companies.*—The personnel of ambulance companies normally follow soon after the collecting companies. If casualties are heavy and the attainment of the first objective slow, the personnel of those companies should be used as litter bearers to assist in evacuating casualties to the medical stations on or near the beaches. In some situations it may be impossible to land the ambulances until the end of the first phase.

(3) *Hospital companies.*—These companies usually cannot establish hospital stations ashore until the landed forces have gained beach heads at least 4 or 5 miles deep. Local topog-

raphy may sometimes permit earlier establishment of these stations. If such is the case and if boat transportation to shore is available, advantage should be taken of such favorable circumstances to provide these facilities on shore for the care of casualties. Patients in hospital stations will be classified and held until called for by the Army evacuation officer. In opening the initial hospital station after landing, the hospital company may take over the patients and the site of a collecting station near the beach, the collecting company opening a new station farther inland. When companies of two or more battalions of a medical regiment are operating on a beach, a commanding officer will be designated and a command post established for the control of such elements.

(4) *Medical regiment headquarters and headquarters and service companies.*—These companies may be expected to land with corresponding echelons of the division headquarters. The division surgeon, however, should establish an advanced command post when the division command post is opened on shore.

(5) By the end of the first phase, part of the medical regiment of the divisions should be ashore, operating collecting stations, an ambulance service, and perhaps a hospital station near the beach. A medical supply point and dump will be in operation near the beach for the supply of medical units ashore.

NOTE.—Medical organization of a Marine Corps brigade consists of four medical companies, each composed of a headquarters section, collection section, hospital section, and service section. These medical companies land and operate in accordance with the brigade medical plan.

■ 25. NAVY MEDICAL SERVICE DURING FIRST PHASE.—*a. Navy force surgeon.*—With the launching of the initial landing attack, the Navy force surgeon's office becomes the nerve center of the combined activities of the two medical services. The Army force surgeon must maintain close contact with the Navy force surgeon. This is easily done if both are embarked in the same ship. It is necessary that the Navy force surgeon receive prompt and frequent reports of the casualty situation on each landing beach. This will be done normally through signal communication from beach parties. A board in his office should show the bed capacity of each hospital

ship in the landing area as well as that of troop ships previously prepared and staffed to receive slightly wounded from shore. On another board the evacuation officer on his staff keeps the current bed occupancy status of each receiving ship. This measure is of prime importance, since by means of it the actual bed situation throughout the fleet is known with approximate accuracy at all times, and boats returning from shore with patients are routed accordingly. Reports of casualties and bed status are rendered to the Army and Navy staffs periodically; hourly, if called for.

b. Beach medical service.—(1) The naval evacuation service on a beach forms a section in the beach master's organization. The skeleton of this section, at least, should accompany the beach master in the first boat group and be reinforced to full requirements at the earliest opportunity thereafter. The task of the naval medical evacuation officer is to organize and operate the service of evacuation from the beach. His activities include—

(*a*) Establishment and marking with the Red Cross flag and other necessary identifying signs, an evacuation station at a site approved by the beach master.

(*b*) Establishing and maintaining close contact with the Army evacuation officer of the shore party.

(*c*) Reception of casualties from the Army evacuation officer and loading them into boats according to their classification for movement to designated receiving ships.

(*d*) Keeping the Navy force surgeon informed of the casualty situation on his beach through naval signal communication on the beach and by messages transmitted by naval personnel in boats carrying casualties from shore to ship.

(*e*) Forwarding to the Army evacuation officer messages and supplies received by him for the Army medical service ashore.

(2) If casualties are collecting in large numbers on the beach in the early stages of the attack, naval medical embarkation officers must be alert to take advantage of any opportunities to send as many of them as practicable to ships by returning boats. This is generally desirable although there may have to be a ship-to-ship transfer of these cases later.

c. Evacuation at end of first phase.—By the end of the first phase, evacuation from shore should have progressed to the use of a considerable number of improvised ambulance boats (previously used in landing combat elements) now provided with medical personnel and equipment from hospital ships or transports for the emergency treatment of casualties en route; perhaps a few regular ambulance boats entitled to fly the Red Cross flag; an organized ambulance boat service to most of the beaches; and the delivering of all casualties from beach evacuation stations to designated ships.

■ 26. ARMY MEDICAL SERVICE DURING SECOND PHASE.—During this phase, any remaining elements of the divisional medical regiments (or medical battalion, triangular division), including transport, are landed and take positions and missions similar to those assigned them in offensive land operations.

a. Corps medical regiment.—By the end of this phase, the corps medical regiment may be expected to have landed and relieved the divisional medical regiments of their functions at the beaches, allowing these elements to move forward in support of the action of the division.

b. Medical supply.—The medical supply service for the troops ashore is further developed in this phase; the medical supply point at the beaches is more systematically organized, supplies in the medical dump built up, and depleted stocks of the medical units inland replenished.

■ 27. NAVAL MEDICAL SERVICE DURING SECOND PHASE.—By the end of this phase, the naval medical service should have succeeded in developing and systematizing the evacuation from shore and at the receiving end; that is, in the fleet itself. This it is enabled to do through—

a. Increased number of landing boats available for the use of the medical services.

b. Inauguration of a regular ambulance boat service to the more important beaches.

c. Docking facilities, though limited, at important beaches.

d. Use of a small number of barges and lighters now made available to the medical services, whereby wounded can be removed from a beach more expeditiously, comfortably, and in much greater numbers.

e. Fewer transfers of patients from ship to ship. If casualties are heavy, evacuation from shore in the early stages of the landing is more or less an emergency measure and patients are brought in many instances to whatever ship may be most practicable for the boat carrying them. As communication from the beaches becomes well established, and hence the numbers and classification of casualties on each beach reach the Navy force surgeon with some regularity, delivery of casualties can be made to ships according to patients' classification and ships' vacant beds. This favorable development proceeds in like proportion with the increasing facilities noted in *a* to *d* above.

■ 28. ARMY MEDICAL SERVICE DURING THIRD PHASE.—*a. Surgical hospitals* generally may be landed and established early in this phase. Their use to the extent of their limited bed capacity is of distinct advantage to the most seriously wounded.

b. Evacuation hospitals, comparatively large units, should not be landed and established until a sufficient advance inland has been made to afford them suitable choice of location and reasonable assurance that they will not become involved in local reverses to our forces.

c. General and station hospitals in which definitive treatment is carried out cannot be opened until a secure oversea base has been established. If general hospitals then must be built, at least 4 months will probably be required for their erection and equipment. It may be possible to convert existing buildings to general hospital use in much less time. The oversea expeditionary plan may or may not contemplate the establishment of general and station hospitals in the occupied territory.

d. Army medical laboratories (mobile) will be landed as early in the third phase as their use becomes practicable and necessary.

e. Army medical depots will be established ashore at such time and points as conform to the supply plan of the expeditionary forces after a base has been secured.

■ 29. NAVY MEDICAL SERVICE DURING THIRD PHASE.—*a.* In this phase the naval medical service may be expected to have at

its disposition sufficient boats of suitable types to enable it to perfect shore to ship evacuation. Evacuation from some beaches probably will have ceased and the other beaches have been provided with adequate wharf and docking facilities. Hospital ships may be relocated at anchorage to shorten the average trip from beach to ship.

b. In this phase, in which the Navy is best equipped and organized to carry out its part of the evacuation service, the Army is gradually adding to its facilities for caring for its own casualties ashore. This augmentation continues until, if the Army is successful in its mission and general hospitalization in the occupied territory is contemplated, the Army will eventually hospitalize its casualties in its own establishments. If the Navy is then to continue evacuation for the Army to home ports or other bases, it will still evacuate that part of the Army's sick and wounded which have ceased to be military assets or whose recovery will be a matter of many months.

■ 30. MEDICAL SUPPLY TO LANDING BEACHES.—*a.* In land opertions it is difficult to maintain an adequate supply of blankets, litters, and splinting material at advanced medical stations during combat in spite of the specific provisions made for an exchange of these items for every casualty carried to the rear. It is more difficult in a joint landing operation. Both Army and Navy are involved in this supply to the landed medical units. All medical supplies are on board ship when the attack is launched. Medical personnel landing early can take with them only very small quantities of these items. In the early stages of landing, blankets, litters, and splinting materials cannot be exchanged with any degree of certainty, as troop landing boats, if sometimes used to remove wounded from the shore, may deliver their patients to ships not carrying medical supplies. Furthermore, the boats may not return directly to the beaches but go to another ship to take a boat load of troops ashore.

b. (1) Therefore, the supply of blankets, litters, and splinting and dressing materials on beaches by exchange cannot be relied upon. It is necessary that the joint medical plan make detailed provision for this supply during the landing operations, to include:

(*a*) That medical detachments landing take with them as many of these items as they can man-handle.

(*b*) That a medical dump be established promptly on each beach under the direction of the evacuation officer (shore party), with the necessary personnel to operate it.

(*c*) That boats in the early stages of the attack, landing supplies include some of these essential items of medical equipment.

(d) That as soon as ambulance boats are put into service, they build up, on their runs from ship to shore, as rapidly as possible and maintain ample reserves of blankets, litters, and splinting and dressing materials on each beach.

(*e*) That the naval medical embarkation officer (beach party) take all necessary action to facilitate this supply.

(*f*) That at the beach, exchange with litter bearers and ambulances bringing in casualties from inland be rigidly enforced.

(2) The measures given in (1) above apply especially to the critical first and second phases. Thereafter an organized and more extensive system of medical supply to the landed forces should be in operation.

c. (1) The Navy stretcher is designed for use on board ship. For the movement of large numbers of casualties from shore to ship it is unsatisfactory. Its employment for this purpose would further require the transfer of wounded from the Army litter to the Navy stretcher on the beach.

(2) In joint oversea expeditions it is desirable for the Navy to make the necessary adaptations (litter hoists, litter slideways, bunk straps, etc.) for the use of the Army litter in transferring Army casualties from shore to ship.

■ 31. ALTERNATIVE PROCEDURE IN SORTING AND CLASSIFYING CASUALTIES.—*a.* Ideally, the sorting and classification of sick and wounded is best carried out on shore, thus permitting boats carrying casualties to ships to be systematically and most economically employed, and at the same time reducing to the minimum the time taken and the discomforts to patients in the subsequent secondary evacuation from ship to ship. Practically, in the confused and crowded condition of the beaches often occurring, the heavy inflow of wounded, the early scarcity and irregularity of casualty carrying boats,

and the uncertainty of the particular ship to which any loaded boat will deliver its patients, shore sorting, as experience has shown, may be far from satisfactory.

b. An alternative procedure is to anchor a hospital ship off each beach, designate it as a sorting station, and at the same time fill it to capacity with casualties requiring early operation and others which are to be evacuated to a home port, transferring the rest to other ships. When this sorting ship is filled with the proper cases it leaves and is replaced at anchorage by another hospital ship. If occupied beaches are close together one sorting ship may serve more than one beach. This method was used extensively by the British at Gallipoli in 1915.

APPENDIX

ILLUSTRATIVE ESTIMATE OF HOSPITAL SHIP BEDS FOR A HYPOTHETICAL JOINT OVERSEA EXPEDITION

■ 1. GENERAL.—The following estimates and computation of hospitalization afloat to accompany a hypothetical joint Army and Navy oversea expedition are meant to serve only as an illustration of how the problem may be approached in the preparation of the medical plan. It represents a situation requiring a large number of beds in class A, class B, and class D hospital ships, but not as high a percentage of such beds as might be necessary in another situation.

NOTE.—For the purposes of this manual, class A hospital ships are those fully equipped hospital ships in commission in the Navy; class B hospital ships are those Navy hospital ships carried in the Navy Register, but not in commission in peacetime; class D hospital ships are those procured and converted and equipped as floating hospitals from commercial shipping and commissioned as hospital ships in the Navy.

The fewer the class A and class B hospital ships available for use in a joint Army and Navy oversea expedition the earlier should estimates be made for the number of beds required afloat in the area of operation. This is necessary because class D hospital ships must be procured, converted, equipped, and manned prior to the expedition's departure from the port of embarkation.

It should be noted that the division of sick and wounded according to their seriousness, between class A and B ships, and class D ships, as made in this illustrative situation, will not be an arbitrary one in practice, provided the class D ships have been converted into modern and fully equipped hospital ships.

■. PRINCIPAL DATA ON WHICH ESTIMATES WERE BASED.—*a.* Enemy army forces believed to be available: Strong in numbers, in fighting qualities, and in armament and defense dispositions; skilled, stubborn, and reinforced resistance probable. Enemy naval resources available known to be much inferior to ours.

b. Army (and) Marine Corps) expeditionary strength 40,000

c. Navy expeditionary strength 12,000

d. Operations area 8 days' fleet sailing time from port of embarkation and base.

■ 3. ESTIMATES.—*a.*

Army sick en route to operations area hospitalized in their own transports (40,000÷1,000×1.65×8 (days))	528
Navy sick en route hospitalized on their own ships (12,000÷1,000×1.65×8 (days))	158
Total expeditionary sick in hospital (on sick list) upon arrival in operations area	686
Additional Army and Navy sick, hospitalized during first 7 days in operations area (686 sick and 7,500 battle casualties deducted from aggregate strength)	506
Total expeditionary sick in hospital to include 7th day after arrival in operations area	1192
Total expeditionary sick requiring evacuation to include 7th day in operations area, 10 percent	119
15 percent of total Army strength being wounded patients, 80 percent of total battle casualties being wounded (initial H hour to include 7th day)	6,000
One-third of wounded, serious, requiring class A and B hospital ship facilities	2,000
One-third of wounded, less serious, requiring class D hospital ship facilities	2,000
One-third of wounded retained ashore or in transports, as slightly wounded	2,000
Total Army casualties and Navy sick requiring evacuation at end of 7th day in operations area	4,119
Total hospital ship beds for Army and Marine Corps to accompany joint expeditionary forces	5,000

b. Twenty days may be assumed to be required for hospital ships in the operations area to make the turn around and begin loading patients again in the landing area, the expe-

ditionary fleet must be followed from the port of embarkation at close intervals by additional hospital ships. The minimum number for this purpose for the Army forces (and Navy sick) are computed as follows:

Army sick hospitalized 8th to 20th day in operations area (31,978÷1000×1.65×13 (days))		686
Navy sick (estimated) hospitalized in same period		251
Total expeditionary sick hospitalized, 8th to 20th day		937
Total expeditionary sick, occurring 8th to 20th day, requiring evacuation from operations area, 10 percent	94	
Additional 6 percent of remaining Army and Marine forces (31,603) in operations area being wounded patients, 8th to 20th day		1,896
One-third of wounded, serious, requiring class A and B hospital ship facilities	632	
One-third of wounded, less serious, requiring class D hospital ship facilities	632	
One-third of wounded retained ashore or on transports, as slightly wounded		632
Total Army casualties (and Navy sick) requiring removal from operations area, 8th to 20th day	1,358	
Total additional hospital ship beds to reach operations area prior to 20th day	1,800	

■ 4. PROVISIONS OF MEDICAL PLAN FOR ARMY FORCES (AND NAVY SICK).—*a.* (1) Hospital ships to accompany expeditionary forces from port of embarkation:

Class A and B hospital ships with normal bed capacity	2,500
Class D hospital ships with normal bed capacity	2,500
Total hospital ship beds accompany expedition	5,000

(2) To arrive in landing area 6th day after the expeditionary fleet:

Class A or B hospital ships with normal bed capacity	450
Class D hospital ship with normal bed capacity of	450

(3) To arrive in operations area 12th day after the expeditionary fleet:

Class A or B hospital ships with normal bed capacity	450
Class D hospital ship with normal bed capacity	450
Total, second and third echelons	1,800
Aggregate hospital ship beds	6,800

b. To the 6,800 hospital ship beds must be added such beds as are determined upon in the plan for the reception of the probable or the possible naval wounded.

c. (1) In this example, no factor of safety has been provided for the numerous possibilities of unforeseen changes in conditions or in the situation, which might increase the hospital ship bed requirements. No allowance has been made for prisoner-of-war casualties. It is only rarely possible to utilize at one time 100 percent of hospital bed capacity.

(2) Ordinary prudence dictates that in the situation here assumed, a reserve of at least 10 percent of hospital ship beds be added. This reserve may initially be held, ready for sailing, at the port of embarkation.

(3) That the number of hospital beds provided for the situation indicated for the first 28 days after sailing from the port of embarkation is conservative, is apparent from the fact that 1,916 of the sick and 2,632 of the wounded, a total of 4,548, are held in the landing area. A considerable percentage of the sick will have returned to duty by the end of this period, but of the wounded a majority will still be on a sick status, probably in part on land and in part on ship board. These sick and wounded may exceed the Navy's hospital resources even after all transports which can possibly be spared for the purpose have been hastily and inadequately fitted out for their hospitalization.

(4) As to the use of transports for the return to the home port or other base of those sick and wounded who in this hypothetical situation have been moved in hospital ships, it is to be recognized that both categories (those in class A and B and those in class D hospital ships) are of such a serious character as to require the medical and surgical care and the facilities of properly equipped hospital ships. History fur-

nishes examples of deplorable and even scandalous instances of the movements of great numbers of the sick and wounded of such joint expeditions from the operations area to a distant base in entirely inadequately converted and medically equipped troop transports; and consequently attended by wholesale deprivations and unnecessary suffering. In the main such conditions are to be ascribed to the initial failure to plan for and to provide as a part of the expeditionary shipping sufficient hospitalization afloat.